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ABSTRACT

The study presented in this document was designed to test, through path analysis, a modified version of the Bean and Metzner (1985) model of nontraditional student attrition in an effort to understand why older students frequently dropped out of a large public university in the Midwest. Four variables from Bean and Metzner's model were deleted and the modified version was used to survey 347 campus freshmen, aged 22 years and over, attending the university in fall 1988. The independent variable was their attrition outcome one semester later. The variables collected by the questionnaire included demographic data and single item Likert-type measures of significant other relationships, family income, work and study hours, institutional commitment, number of children, and intent to leave. Results revealed: (1) that intent to leave, followed by grade point average (GPA) and goal commitment were the most important variables in explaning attrition; and (2) that number of children, weekly study hours, and number of hours enrolled in school failed to contribute directly/indirectly to explaining attrition variance. Despite its limitations, the study concluded that the modified model may have some theoretical relevance in explaining why older students dropped out from a large residential university. Includes 30 references. (LPT)

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Beginning to Understand Why Older Students Drop Out of College

A Path Analytic Test of the Bean/Metzner Model of Nontraditional Student Attrition

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In recent years, higher education attracted new populations of students. Minorities, women, and older students have augmented college enrollment figures as the number of traditional-aged students began to decline. Accompanying the new student populations, however, are some of the same old problems. Most notably, the problem of attrition actually appears larger among some of these new groups than it did among traditional college student populations.

Attrition rates reported for minority students have been consistently higher than the rates provided for total student populations (Lichtman, Bass, and Ager, 1989; McCauley, 1988; Naylor and Sanford, 1982). Attrition rates of older freshmen have been higher than those reported for traditional-aged freshmen, with about 40-50% dropping out their freshman year, and between 60% and 80% leaving prior to completion of their baccalaureate degree (Farabaugh, 1989a; Greer, 1980; Kayla, Yi, and Howard, 1982).

While community colleges and commuter four-year institutions have long felt the impact of nontraditional student attrition, four-year residential universities are just beginning to explore the implications of higher attrition rates among these special student populations.

The study presented here was an attempt to understand why older students dropped out of a large public rural residential university in the Midwest. Previous internal research demonstrated that older students were less likely to graduate than younger students (Farabaugh, 1989a). There was a great deal of speculation as to why these students might be more likely to drop out, but no hard data existed to explore the phenomenon.

In order to study why older students left this university, a data base was created containing potential explanatory variables, and an extensive review of the literature was conducted to determine which variables should be collected. Next, a questionnaire was designed to collect data on the identified variables, and path analysis tested the utility of this model for explaining nontraditional student attrition. These steps are briefly described below. Finally, results of the study are presented and discussed.

Seeking a Theory to Explain Why Older Students Drop Out

A large body of research has explored the reasons for traditional college student attrition. Tinto's (1975) theory is perhaps the most widely accepted and tested model for explaining attrition among this population.

Older students, however, are different from younger students. These basic differences may severely limit the applicability of the Tinto model in explaining attrition among older college students. There are basic developmental differences between the two age groups (Erikson, 1963, 1968; Gould, 1972; Havighurst, 1953, 1972). Older students often enter postsecondary education for reasons far different from those reported by their youthful counterpart (Greenfeig and Goldberg, 1984; Iovacchini, Hall and Hengstler, 1985; Sewall, 1984).

Once students have entered higher education, differences have been found between the learning style preferences of older and younger college students (Hopkins, 1982; Roelfs, 1975). Some researchers have detected differences in the academic performance of older vs. traditional-aged college students, with older students having a significantly higher GPA than younger (Richter-Antion, 1986; Von der Embse and Childs, 1979). Roelfs (1975) found that older students spend more hours studying and enroll for fewer hours than do their

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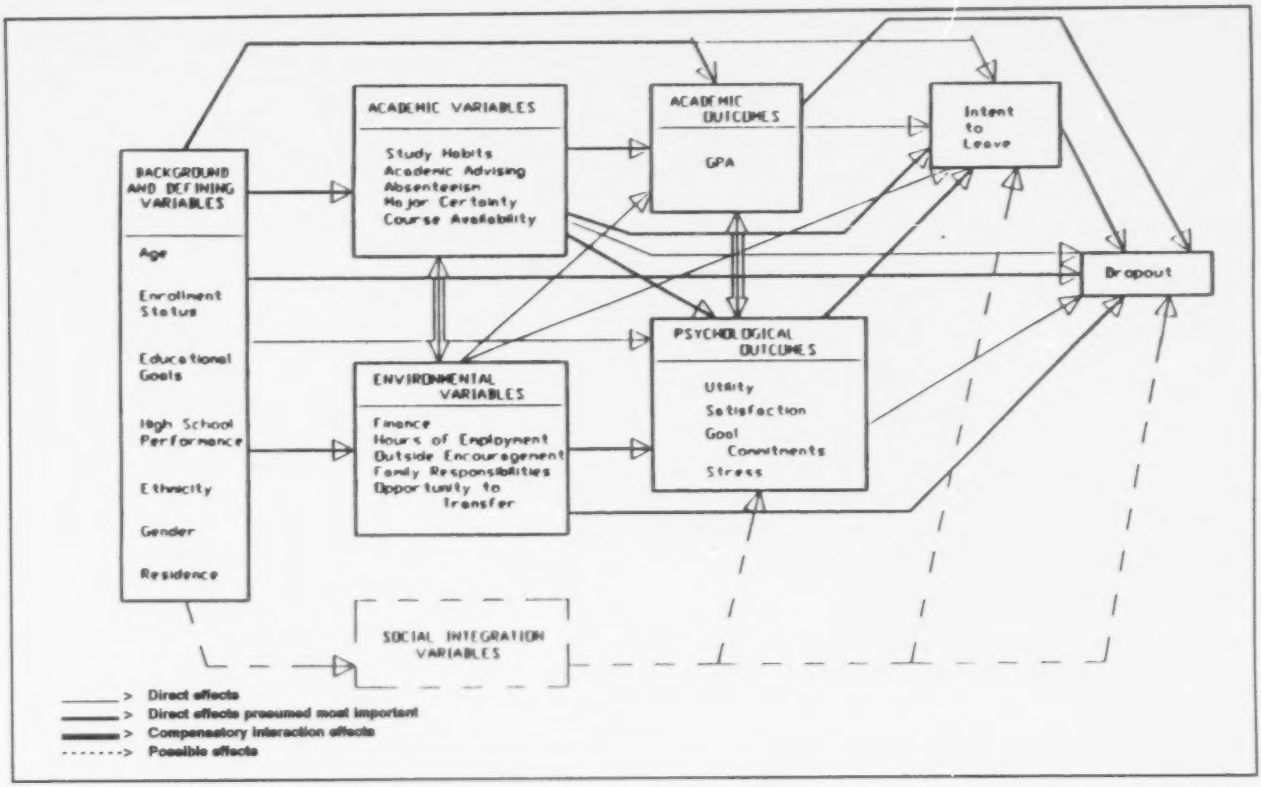


Figure 1. "A Conceptual Model of Nontraditional Undergraduate Student Attrition," by Bean and Metzner. In *Review of Educational Research*, 55(4),485-540. Copyright 1985, American Educational Research Association. Adapted by permission of the publisher.

younger counterpart. Older students have expressed the need for different types of support services than traditional students. For example, nontraditional students were more likely to desire day-care, time-management training, faculty recognition of their external responsibilities, and availability of courses and financial aid information(Christian and Wilson, 1985; Lamb-Porterfield, Jones, and McDaniel, 1987; Schlossberg, 1986; Smallwood, 1980).

Schlossberg (1986) cautioned that the nontraditional student population is by no means homogeneous. In fact, there is much more diversity among this population than among traditional students. Traditional students enter higher education with roughly equivalent experiences. They have completed high school, earned their driving privileges, lived with their parents, and perhaps held summer jobs. Older students, in contrast, bring tremendous variation to the learning environment. They come from various occupational backgrounds, have lived in many places, and have experienced a wealth of activities by the time they arrive in the classroom. So this diversity also serves to distinguish the older nontraditional student population from the traditional-aged population.

Given these differences, it is not surprising to suggest that older students probably leave higher education for reasons far different from those identified in Tinto's model of student attrition. For example, Social Integration, an important explanatory variable in the Tinto model, appears to have little empirical support as a reason for explaining nontraditional college student attrition (Greer, 1980; Metzner and Bean, 1987; Pascarella, Duby and Iverson, 1983).

Another theory of attrition, tailored to the experience of nontraditional students, was proposed by Bean and Metzner (1985). While some of the variables remained the same as those in the Tinto model, the Bean and Metzner model also included new variables. This model is presented in Figure 1.

Independent reviews of the empirical literature on nontraditional students suggested that the Bean and Metzner (1985) model accurately described the salient variables involved in nontraditional college student attrition (Bean and Metzner, 1985; Farabaugh, 1989b). In a study of commuter students of all ages, Metzner and Bean (1987) found that four variables were significantly and directly related to dropout: college GPA, intent to leave, Hours Enrolled, and Study Habits. Their sample consisted of 624 part-time freshman commuter students with an average age of 23.8 years. Their model, tested with path analysis, accounted for 29% of the variance in attrition outcome.

The present study tested a revised version of the Bean and Metzner (1985) model of nontraditional student attrition. Some of the variables were dropped from the model and others were rearranged in order to maintain an accurate temporal sequence. The sample consisted of older freshmen attending a large public rural residential university in fall 1988. Their attrition outcome one semester later, in spring 1989, was the dependent

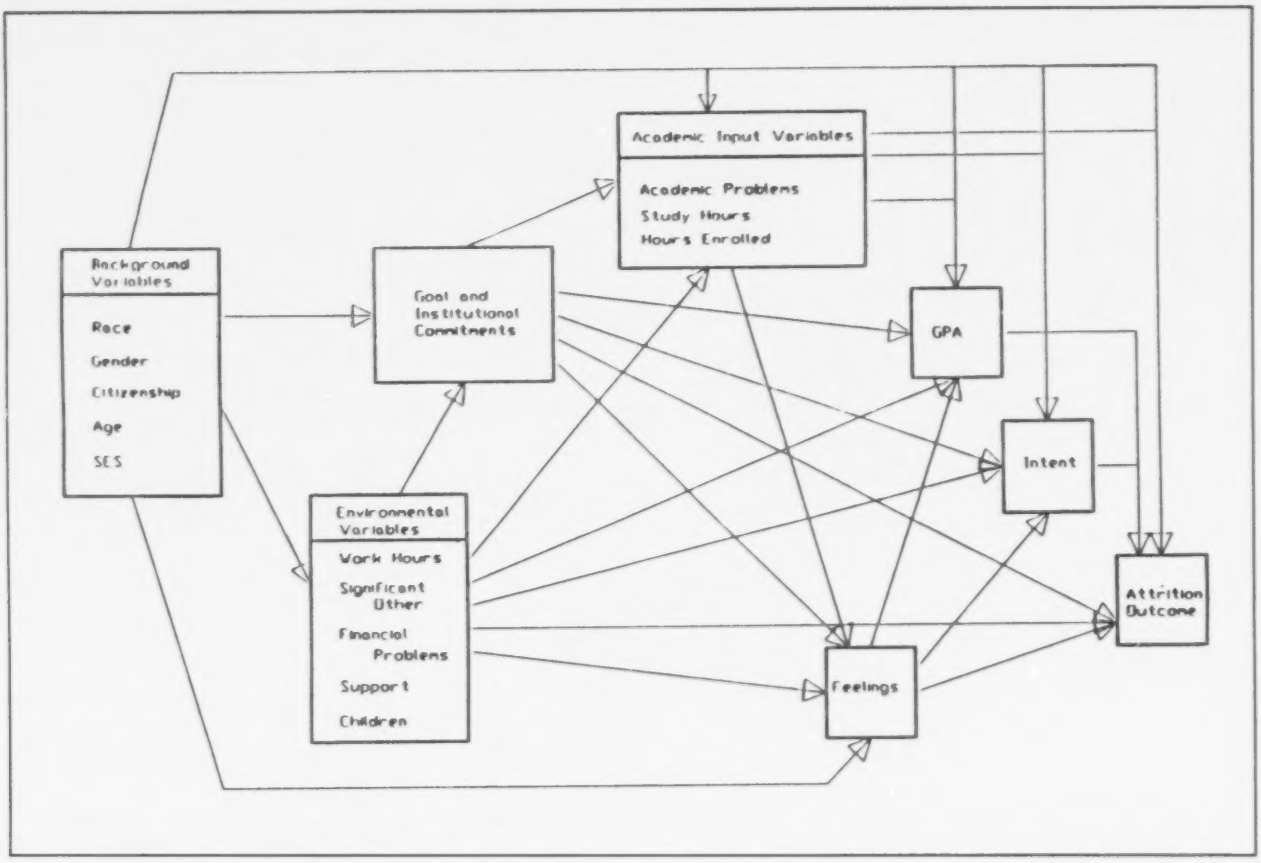


Figure 2. Revised model of nontraditional student attrition.

Note: Variable categories with empirical indicators specified. The modifications to Bean and Metzner's original theoretical model were suggested by a review of the research literature and by the special characteristics associated with an older college student sample.

variable. The model, the sample, and the methodology are described in the materials that follow.

Modifications of the Bean and Metzner Model

The model tested through path analysis in this study is displayed as Figure 2. The original model contained seven major categories of variables, while the modified model had eight variable groups.

Four variables were deleted from Bean and Metzner's (1985) Background and Defining Variables category. These were Residence, High School Performance, Enrollment Status, and Educational Goals.

Since the majority of nontraditional students live off-campus, the variability in residence was severely restricted. There was no point to including a variable which, in fact, was a constant for this particular student population.

Institutional records on the high school performance of older students were not collected as part of their admission process. It was assumed that whatever contribution high school performance made to the explanation of attrition, its influence would be overshadowed by the impact of life experience, present academic performance, and motivation.

Enrollment status, that is, part-time vs. full-time enrollment, does not occur prior to matriculation. It is part of the academic process. The temporal sequence of this variable suggested that its placement in the Academic Input Variables category of the revised model was theoretically more appropriate than in the Background category of the original Bean and Metzner (1985) model.

Finally, Educational Goals became a separate category in the revised model. A student does not inherit goals and goal commitment. Instead, she or he develops educational goals and commitment through a combination of familial input, life experience, and exposure to the educational process. Again, the logic behind this revision was time sequence. Goals follow from rather than precede the student's life experiences.

The present model retained the rest of Bean and Metzner's (1985) proposed categories of variables. The indicators used to measure these varied slightly, but the conceptual nature of the variables remained the same in both models.

Sample and Response Rate

In fall 1988, 347 students at the university were identified in the Student Information System as on-campus freshmen, aged 22 years and older, and registered as of

the 10th day. A questionnaire was mailed at mid-semester to all students meeting these criteria. After a second mailing three weeks later and a follow-up telephone contact one week after the second mailing, a total of 174 freshmen responded (50% response rate).

Over half of the respondents were first-time freshmen (55%), while the remaining students were transfer or continuing freshmen. Fifty-five percent of the sample were male students. The ethnic/racial breakdown was 76% Caucasian, 9% minority (included Black, Asian, Native, and Hispanic Americans), and the remaining 15% foreign. About one-third of the sample were married (32%). One-third of the sample were parents, while nearly 40% were employed while attending this university. The mean age of the sample was 28.2 years (s.d.=7.5), the mean cumulative GPA was 2.7 (s.d.=1.08), and the mean number of credit hours for which they had enrolled was 12 (s.d.=4.49).

There were differences between respondents and non-respondents. Chi-square tests were run on categorical data, and t-tests were used to examine differences on the continuous variables. All were tested at the .05 probability level. No differences were found between the two groups in terms of matriculation status, race, academic unit, or fall-term credit hours. Statistically significant differences were found in gender (respondents more likely to be female), marital status (respondents more likely to be married), age (respondents more likely to be older), GPA (respondents had higher GPA), formal withdrawal from the university (non-respondents more likely to have formally withdrawn), and attrition status in spring 1989 (non-respondents more likely to have dropped out). These differences should be remembered when interpreting and generalizing results of the study presented here.

Operational Definitions and Data Collection

Variables were collected from two sources. Demographic variables (sex, race, citizenship, age, and fall 1988 credit hours) were retrieved from the Student Information System (SIS) for all 347 students. A file containing this information was merged with the SIS spring 1989 data tape to collect fall 1988 GPA and attrition status for all students.

The second source of data was the Nontraditional Student Experience Questionnaire (Farabaugh, 1989b). Research literature guided the development of this questionnaire. This instrument was pilot tested in spring 1988 and revised prior to mailing in fall 1988. The survey instrument had face validity based upon feedback from both nontraditional students and university personnel involved with these students.

The variables collected by the questionnaire included single-item likert-type measures of Significant Other relationships, SES (family income), number of Children, Work Hours, Study Hours, Institutional Commitment, and Intent to leave. Indices were developed for the remaining measures. In each case, the index value equals the sum of the individual item responses. All response categories were based on likert scaling. Table 1 explains these five other variables. Chronbach Alpha reliability coefficients for internal consistency are provided in the right-hand column.

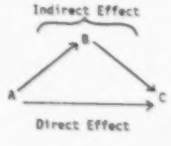
TABLE 1
Indices Used in the Test of the Causal Model

Variable	Questionnaire Items	Alpha
Financial Problems	Obtaining financial aid	.76
	Obtaining financial aid information	
	Finding employment while in school	
	No problem=1	
	Major problem=5	
Goal Commitment	Plan to earn an undergraduate degree	.73
	I really want to graduate	
	Strongly agree=5	
	Strongly disagree=1	
Support	My old friends (before school)	.76
	My parents	
	My college instructors	
	My significant other	
	My neighbors	
	My child(ren)	
	My college friends	
	Non-instructional staff at college	
	Very supportive=5	
	Not at all=1	
Academic problems	Attending every class	.73
	Registering during day	
	Finding study time	
	Dealing with teaching assistants	
	Getting advisement appointment	
	Scheduling other commitments around class time	
	Dealing with instructors	
	Understanding course material	
	Finding self-discipline to study	
	Test anxiety	
	Big problem=5	
	No problem=1	
Affective reaction (feelings)	Confident	.81
	Proud	
	Peaceful	
	Intellectual	
	Happy	
	Life in personal balance	
	Competent	
	Much stronger before college=1	
	No change=3	
	Much stronger as a college student=5	
	Angry	
	Anxious or stressed	
	Afraid of failing	
	Overwhelmed	
	Lonely	
	Guilty	
	Much stronger before college=5	
	No change=3	
	Much stronger as a college student=1	

Path Analysis

Path analysis allows for the examination of indirect as well as direct relationships between the independent variables and the dependent variable. When process is considered as important or more important than just the outcome, then path analysis provides powerful statistical support for explanation of an hypothesized causal process.

To illustrate the benefit of path analysis over ordinary regression analysis, consider the example of the simple three-variable causal model below.



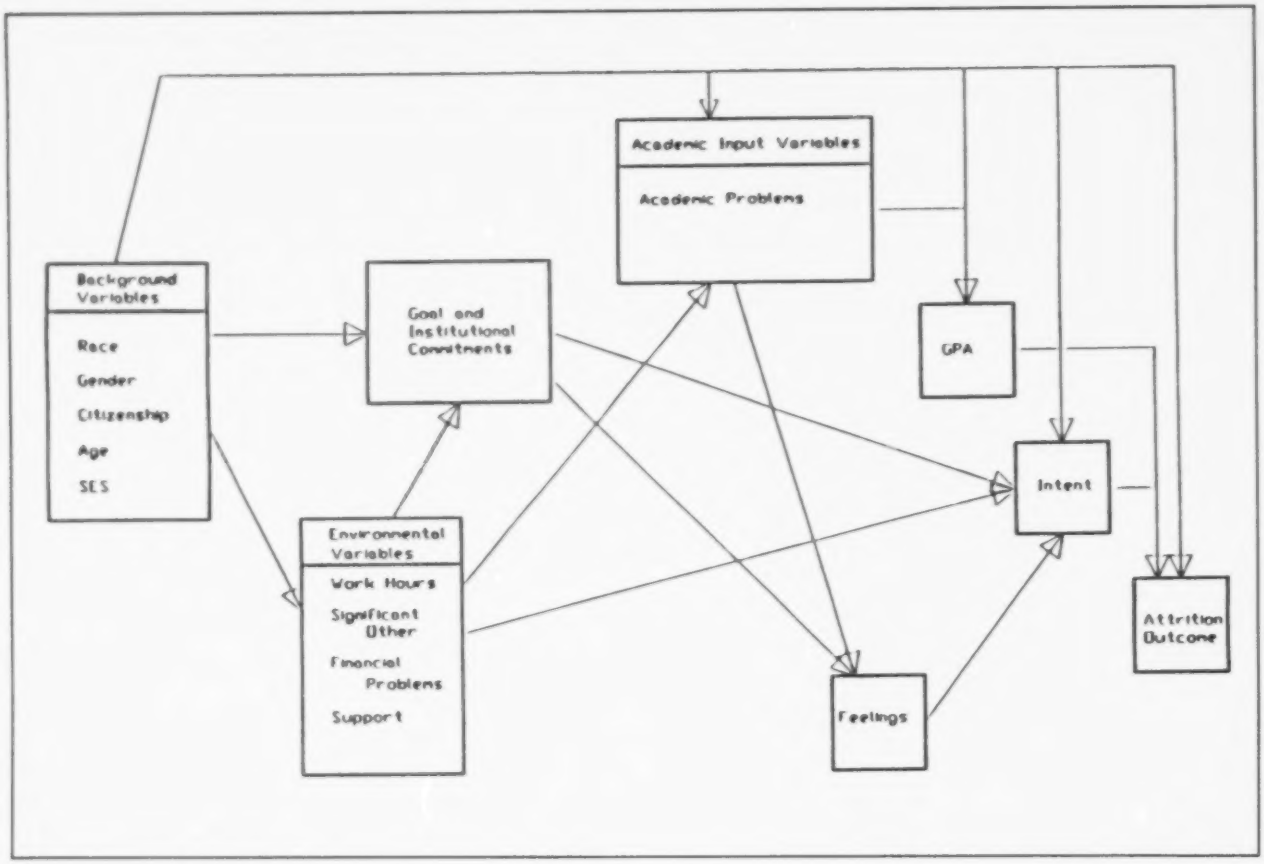


Figure 3. Trimmed causal model used for the path analysis.

Note: Stepwise regression was used to delete paths which did not contribute statistically to the explanation of the dependent variable. Indicators failing to meet the .05 level of significance were dropped from analysis at this point.

Ordinary regression analysis provides a measure of the relationship between A and C. One coefficient summarizes this relationship. In contrast, path analysis provides a means to dissect the relationship between A and C into two parts: the direct effect of A on C and the indirect effect of A on C through the intervening variable B. The total effect of A on C is the sum of its direct and indirect effects.

In the diagram, variable A is called exogenous. Its variance is explained by variables outside the specified model. All demographic and background variables in the revised Bean and Metzner (1985) model are exogenous variables. The remaining variables in the model are called endogenous (like B and C above).

Whereas ordinary regression analysis only reveals the variables explaining the dependent variable (C in model above), path analysis yields explanatory information on all endogenous variables (i.e., B and C). In the model tested in the present study, the variables which explain intent to leave and GPA are extremely important if we are to understand why older students drop out of college. It is not enough to learn that intent and GPA are predictors of attrition, we also need to know which factors influence intent and GPA in order to better understand the attrition process.

It is critical in a path analysis to accurately specify the causal model. That is why a careful review of the research literature was conducted to determine which variables were to be included in the model. In a nonrecursive path analysis, where all relationships are predicted to be unidirectional, temporal sequence of the endogenous variables is crucial. The present study employed nonrecursive path analysis, hence the reordering of the variables in the original Bean and Metzner (1985) model to accurately portray the process leading up to student decisions regarding attrition. Also, two iterations of regression are required in path analysis: the first to trim the model so that only significant variables are included and the second to calculate the resultant regression coefficients.

Stepwise regression was employed to perform the path analysis and thus to test the causal model in the present study. Variables were entered into fourteen regression equations, one equation for each endogenous variable serving as dependent variable. In the first pass to trim the model, variables failing to yield significant slopes at the .05 level were deleted from the equations.

The stepwise regression procedure produced only the

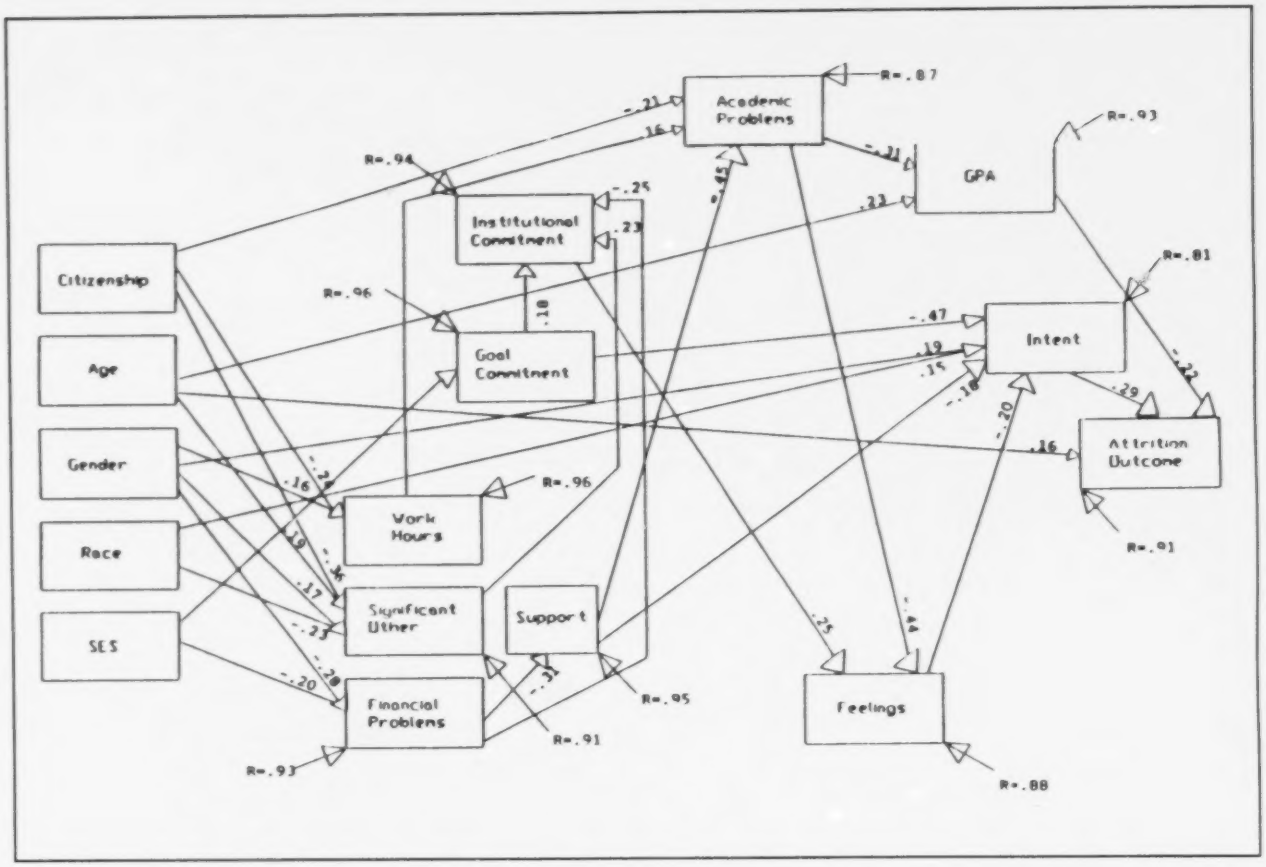


Figure 4. The path diagram: Empirical explanation of nontraditional student attrition.

Note: Direct path coefficients reported near arrows. These are standardized regression coefficients. Indirect coefficients can be calculated by multiplying all direct coefficients included in a path. Residual coefficients (R) are reported for each independent variable where $R_x = \sqrt{1-R^2}$.

direct effects reported in Table 2 and noted on the path diagram (Figure 4). The indirect effects were then calculated manually by tracing the various paths leading to each endogenous variable and summing the product of each path.

All regression coefficients were reported as standardized beta weights in order to compare the relative effects of one independent variable to another. For a complete description of path analysis, see Asher (1983), Wolfle (1985), or Farabaugh (1989b).

Results

Results of the path analysis are summarized in Figures 3 and 4 and Table 2. The paths deleted when trimming the model are identified first. Second, the direct relationships between the independent variables and attrition outcome are discussed. Following this, the indirect relationships (or paths) to attrition are explored. Fourth, the relative importance of the total effects in explaining attrition among this sample are described. Finally, these findings are contextualized by briefly comparing the results of this path analysis on older students to Metzner and Bean's (1987) path analysis results based on traditional-aged commuter students.

Deleted Paths. A total of nineteen variables were entered into the regression equations to trim the causal model. Using stepwise regression, any independent variable which was not a statistically significant predictor ($p < .05$) of either the dependent variable or of another independent variable found to be related to attrition was dropped from subsequent analysis.

After trimming the model, all of the major categories of variables remained, but three individual indicators were dropped from subsequent analysis. These variables had significant predictors, but they were not themselves significant predictors of other variables. (See Figure 3 for an illustration of the trimmed model.)

The three variables which failed to contribute either directly or indirectly to explaining attrition variance were number of Children, number of Hours Enrolled in school, and number of Study Hours per week. This was an interesting finding since all three variables yielded significant zero-order correlations with attrition, as did Age, GPA, and Intent. The latter three variables proved to be strong predictors of attrition in this study.

Multicollinearity may explain why these three variables failed to predict attrition. Number of Children, Hours Enrolled, and Study Hours were each highly correlated with other variables in the model. These other variables

were retained. One of the strongest zero-order correlations was between Marital Status and Children (r=.48). Students who worked more hours both studied for fewer hours (r = -.26) and enrolled for fewer hours (-.50). Since Work Hours was retained as a predictor, Study Hours and Enrollment Status made only negligible unique contributions to explaining attrition variance. The same was true of the variable "number of Children," since the majority of parents were also married.

Also note that many of the hypothesized relationships disappeared in the trimmed model. For example, Figure 2 suggested that both Background Variables and Environmental Variables would be related to the students' Feelings resulting from their return to college. The initial regression analysis to trim the model, however, demonstrated that these data did not empirically support such relationships.

Direct Relationships. The original model predicted that all eighteen independent variables would be directly related to attrition, and also that many would be indirectly related. Three variables were directly related to attrition. Intent to leave, fall 1988 GPA, and Age of the student yielded statistically significant ($p < .05$) standardized regression coefficients. Figure 4 displays these relationships (see arrows pointing directly to attrition outcome). Also, see column 2 on Table 2 for a summary of all direct effects uncovered in the path analysis.

The strongest explanatory variable, Intent to leave, was positively related to attrition (.29). The more likely a student's intention to leave college prior to degree completion, the greater the likelihood that she or he did not return the following semester. GPA was negatively related to attrition (-.22); that is, the lower the GPA, the more likely a student was to drop out. The third direct relationship involved Age as independent variable (.16). In general, older students were more likely to drop out after a semester than younger students.

Indirect Relationships. Table 2 provides detailed information on the relationships which proved statistically significant in testing this causal model. The most salient effects (and those discussed here) are the effects noted when regression was performed with attrition outcome as the dependent variable. In this analysis, eleven independent variables were indirectly related to attrition. All significant indirect paths passed through either GPA or Intent to leave. (Refer to the path diagram, Figure 4.)

Four variables did not have an indirect relationship with attrition. Theoretically, Intent and GPA could only be directly related to attrition. Significant Other and Institutional Commitment, although retained in the trimmed model, yielded miniscule indirect effect coefficients (-.003 and -.015 respectively). Their importance resided only in their contributions to explaining other endogenous variables related to attrition.

Referring to the path diagram, Figure 4, one indirect path is tracked below to illustrate the process. The reader is invited to dissect the path diagram further to explore the remaining indirect relationships.

Gender was indirectly related to attrition via eight paths, six passing through Intent and two through GPA. Both positive and negative paths were detected. As an example of one path, trace the relationship on Figure 4, from Gender to Financial Problems (-.28), to Support (-.31), to Academic Problems (-.45), to GPA (-.31), to Attrition (-.22). The indirect path coefficient describing

Table 2
Breakdown of Effects Generated by Paths in Trimmed Causal Model

Dependent Variable (Independent Variables)	Zero-Order Correlation	Direct Effects	Indirect Effects	Total Effects	Rank Order
Effects on Work Hours					
of Citizenship	-0.23 *	-0.24 *	0.00	-0.24	1
of Gender	0.15 *	0.16 *	0.00	0.16	2
Effects on Sig. Other					
of Age	0.23 *	0.19 *	0.00	0.19	3
of Citizenship	-0.23 *	-0.36 *	0.00	-0.36	1
of Gender	0.23 *	0.17 *	0.00	0.17	4
of Race	0.04	-0.22 *	0.00	-0.22	2
Effects on Financial Problems					
of Gender	-0.30 *	-0.28 *	0.00	-0.28	1
of SES	-0.22 *	-0.20 *	0.00	-0.20	2
Effects on Support					
of Financial Problems	-0.32 *	-0.31 *	0.00	-0.31	1
of SES	0.18 *	0.00	0.06	0.06	3
of Gender	0.07	0.00	0.09	0.09	2
Effects on Goal Commitment					
of SES	-0.24 *	-0.25 *	0.00	-0.25	1
Effects on Inst. Commitment					
of Financial Problems	-0.25 *	-0.25 *	0.00	-0.25	1
of Significant Other	0.19 *	0.23 *	0.00	0.23	2
of Goal Commitment	0.17 *	0.18 *	0.00	0.18	3
of SES	0.01	0.00	0.01	0.01	8
of Gender	0.15 *	0.00	0.11	0.11	4
of Race	0.03	0.00	-0.05	-0.05	6
of Citizenship	-0.11	0.00	-0.08	-0.08	5
of Age	0.18 *	0.00	0.04	0.04	7
Effects on Academic Problems					
of Support	-0.39 *	-0.45 *	0.00	-0.45	1
of Citizenship	-0.15 *	-0.21 *	-0.04	-0.25	2
of Work Hours	0.16 *	0.16 *	0.00	0.16	3
of Financial Problems	0.19 *	0.00	0.14	0.14	4
of Gender	-0.02	0.00	-0.01	-0.01	6
of SES	-0.08	0.00	-0.03	-0.03	5
Effects on Feelings					
of Academic Problems	-0.40 *	-0.44 *	0.00	-0.44	1
of Inst. Commitment	0.25 *	0.25 *	0.00	0.25	2
of Goal Commitment	0.08	0.00	0.04	0.04	8
of Financial Problems	-0.07	0.00	-0.12	-0.12	4
of Significant Other	0.05	0.00	0.06	0.06	7
of Support	0.11	0.00	0.20	0.20	3
of Work Hours	-0.07	0.00	-0.07	-0.07	6
of SES	0.03	0.00	0.01	0.01	9
of Gender	0.08	0.00	0.04	0.04	8
of Age	0.12	0.00	0.01	0.01	9
of Citizenship	0.03	0.00	0.09	0.09	5
of Race	0.03	0.00	-0.01	-0.01	9
Effects on Fall GPA					
of Academic Problems	-0.23 *	-0.31 *	0.00	-0.31	1
of Age	0.19 *	0.26 *	0.00	0.26	2
of Work Hours	0.06	0.00	-0.05	-0.05	5
of Support	0.10	0.00	0.14	0.14	3
of Finances	-0.04	0.00	-0.04	-0.04	6
of Citizenship	0.08	0.00	0.08	0.08	4
of SES	0.15 *	0.00	0.01	0.01	7
Effects on Intent to Leave					
of Goal Commitment	-0.41 *	-0.47 *	-0.01	-0.48	1
of Feelings	-0.20 *	-0.20 *	0.00	-0.20	2
of Gender	0.21 *	0.19 *	-0.02	0.17	3
of Support	-0.20 *	-0.18 *	0.04	-0.14	5
of Race	0.15 *	0.15 *	0.00	0.15	4
of Inst. Commitment	-0.05	0.00	-0.05	-0.05	9
of Academic Problems	0.15 *	0.00	0.09	0.09	7
of Significant Other	0.04	0.00	-0.01	-0.01	11
of Gender	0.21 *	0.00	-0.02	-0.02	10
of SES	0.05	0.00	0.11	0.11	6
of Financial Problems	0.00	0.00	0.08	0.08	8
of Work Hours	0.15	0.00	0.01	0.01	11
Effects on Attrition Outcome					
of Intent to Leave	0.30 *	0.29 *	0.00	0.29	1
of Fall GPA	-0.25 *	-0.22 *	0.00	-0.22	2
of Age	0.16 *	0.16 *	-0.05	0.11	4
of Feelings	-0.13	0.00	-0.06	-0.06	7
of Goal Commitment	-0.31	0.00	-0.14	-0.14	3
of Academic Problems	0.07	0.00	0.09	0.09	6
of Support	0.02	0.00	-0.10	-0.10	5
of Work Hours	0.14	0.00	0.02	0.02	10
of Financial Problems	-0.03	0.00	0.03	0.03	9
of SES	-0.11	0.00	0.03	0.03	9
of Race	0.08	0.00	0.05	0.05	8
of Citizenship	-0.14	0.00	-0.02	-0.02	10
of Gender	0.08	0.00	0.05	0.05	8

* Statistically significant at $p <= .05$.

this particular relationship between Gender and Attrition was -.003, obtained by multiplying all of the direct path coefficients involved.

The sum of this one path coefficient (-.003) plus the seven other indirect path coefficients linking Gender to Attrition is the Indirect Effect for Gender reported in Table 2 (.05). Since a direct relationship between Gender and Attrition was not found, no direct effect was reported. Hence, the total effect of Gender in explaining Attrition outcome was .05 (see Table 2).

Relative Importance of Independent Variables. The relative importance of each independent variable in the explanation of attrition in this sample can be determined by examining the magnitude of the total effects coefficients reported in Table 2. The far right column provides a rank ordering of the importance of these variables in explaining attrition.

The most important explanatory variable in this model was Intent to leave (.29), followed by GPA (-.22), and Goal Commitment (-.14). Three other independent variables proved important in the explanation of attrition relative to the others: Age (.11), Support (-.10), and Academic Problems (.09).

Students who expressed an intention to leave college prior to degree completion were actually more likely to drop out. Lower GPAs were often associated with attrition. The greater a student's commitment to the goal of earning a degree, the less likely she or he was to drop out. Older students in general were more likely to drop out, but older students feeling more supported and having higher GPAs were less likely to drop out. The more support a student perceived from family, friends, and university personnel, the less likely she or he was to drop out. Finally, the fewer academic problems a student reported, the more likely she or he was to persist in college.

Comparison of Results to the 1987 Metzner and Bean Study. The fact that many of the predicted relationships for this model held up under statistical significance testing indicates that the theory has some empirical validity in explaining attrition among older students. Metzner and Bean (1987) concluded the same after testing the model with data from a sample of commuter students.

Metzner and Bean found that four variables yielded significant direct path coefficients: GPA (-.36), Intent (.28), Hours Enrolled (-.16), and Study Skills (.09). The present study also demonstrated that GPA (-.22) and Intent (.29) were significant direct predictors of attrition. Metzner and Bean's other two significant direct relationships resulted in dead-end paths in the present study. Different samples could explain this discrepancy. In the present study, variance was restricted for both Hours Enrolled and Study Hours. The findings of both studies are examined and compared in further detail elsewhere (Farabaugh, 1989b).

Metzner and Bean's (1987) model explained 29% of the variance in attrition outcome, where attrition was defined as non-enrollment after one year. In their sample, 39% of the students had dropped out within the study period. The model tested in the present study explained 18% of the variance in attrition after a single semester. Only 16% of this sample had dropped out the following semester.

Nunnally (1967, p. 133) stated that when a dichotomous dependent variable nears either extreme (in this case 0% or 100% dropout behavior), the maximum possible correlation, and thus, by definition, the maximum possible variance explained, both will be attenuated. This curvilinear relationship is shown in Figure 5. With this qualification in mind, both studies explained approximately 47% of the variance which could be explained based upon the limited distribution of the dependent variable.

Limitations of this Study

Although about half of the variance which could be explained was explained by the variables included in this model, using only a single semester to measure attrition outcome was a limitation of the present study. As exploratory research, one semester was acceptable to determine whether the model had theoretical utility in explaining attrition among older students. However, more variation in the dependent variable is needed if the model is to be used to guide retention efforts.

A second limitation of this study was its focus on a single institution. Attrition research has often been criticized for its failure to examine multiple institutions of higher education. As a result, only institutional attrition is explained, while the reasons for attrition from higher education in general remain unclear. For guiding retention efforts, however, single institution studies are recommended.

A third limitation of the study was the fact that the sample was not a pure freshman cohort. The number of entering first-time freshmen in any one semester would yield a sample too small for statistical analysis. Thus, this sample contained all freshmen, first and second semester. Future research should attempt to separate the two groups and to track a pure freshman cohort.

Only one indicator of SES was used in this study, family income. Future research should include indicators of parental educational attainment and employment in order to more accurately measure SES. Further, two questions on family income should be asked of respondents: the parent's income and the student's own income. This distinction was not clear in the measure of family income used in this study.

Conclusions and Implications for Retention of Older College Students

The modified Bean and Metzner (1985) model of nontraditional student attrition which was empirically examined in this study appeared to have some theoretical relevance in explaining why older students dropped out of a large, residential university. Although the reported R^2 was small, the path analysis showed that many of the relationships predicted by the model held up under statistical scrutiny.

The great value of path analysis is its ability to explore indirect as well as direct relationships among the variables in the causal model. In the model of nontraditional student attrition tested here, these indirect paths merit our fullest attention. Examining the significant predictors of the two major explanatory variables, Intent and GPA, and focusing on the relative ranking of the total effects coefficients reveals potential intervention strategies that may improve institutional retention.

Students who intend to leave the institution should not be included in studies of attrition. Often, however, this is not a question that admission counselors ask of new students. The Student Information System at the institu-

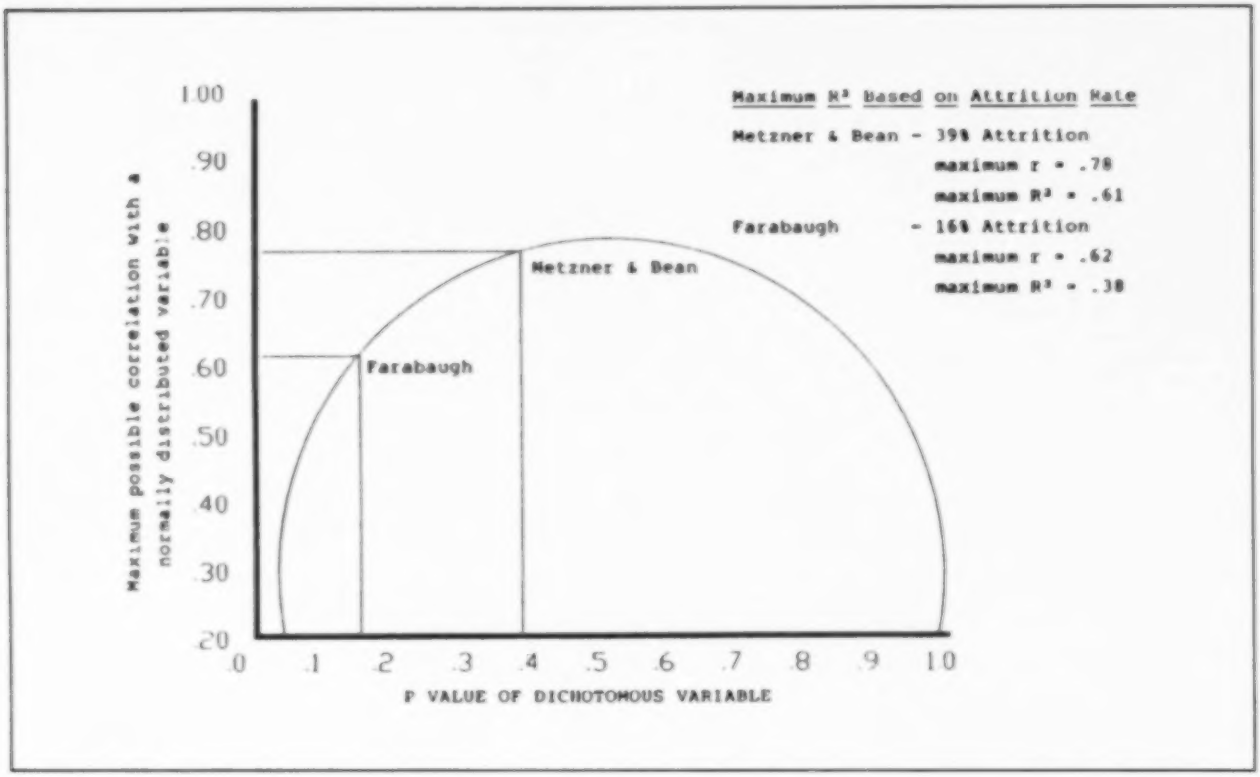


Figure 5. Statistical Results in context: Comparison of the R^2 values in two path analytic studies of nontraditional student attrition. From *Psychometric Theory, by J.C. Nunnally. Copyright 1967 by McGraw-Hill, Inc. Adapted by permission of the publisher.*

tion studied here did not contain any variable which might have indicated a student's intent to Leave. Since this is a strong predictor of actual attrition, it may be time to collect intent to leave as an admission data element and also to exclude from standard studies of attrition behavior those students who never intended to complete a degree at the institution.

The fact that Goal Commitment was the third most important variable in the explanation of attrition among this sample of older college students suggests that we should re-evaluate our definition of "attrition." The word carries many negative connotations and frequently suggests failure. These data highlight the fact that many older students do not seek a baccalaureate degree. They enroll in degree programs and take courses to fulfill some other educational goal. When their goal is attained, they leave. Is this really dropout behavior?

Another significant explanatory variable was Support. Older students were more likely to leave if they perceived a lack of support from family, friends, and university personnel. Institutions can sponsor Family Days or Weekends to promote familial involvement in the student's academic life. Instructors and support staff can make a special attempt to communicate with older students on an equal, rather than condescending level. Other ideas to increase support might include mentoring and peer-counseling programs.

Students who experienced a greater number of academic problems, and hence exhibited a lack of academic adjustment, were also more likely to drop out after a single semester. Perhaps the institution may want to publicize information regarding academic support services to the older student population. It may be that services geared to traditional-aged students do not accommodate the needs of the older population and should be adapted accordingly.

Knowing who drops out of our institutions is not enough. Knowing that these students are most likely to leave during their freshman year serves only to target retention research and strategies to the first year. The time has come to explore the reasons behind attrition, especially among high-risk groups, who also happen to be the future student recruitment pools.

Testing theories which purport to explain why female, older, and minority students do not persist in higher education will identify variables which can be manipulated to improve retention among these groups. Each institution may find that different relationships describe their attrition process. Hence, different strategies should guide their retention efforts. The literature can suggest general retention strategies, but only institutional research can provide data to test the applicability of these strategies at particular institutions.

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